CHEMICAL & ENGINEERING NEWS

C&EN

SEPTEMBER 12, 1994

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MORE SCIENTIFIC NEWS FROM ACS NATIONAL MEETING IN WASHINGTON

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CHEMICAL & ENGINEERING NEWS

C&EN

SEPTEMBER 12, 1994

NEWS OF THE WEEK

■ A chemist and a biochemist are among eight scientists selected to receive the 1995 National Medal of Science. **Page 4**

■ A federal judge approves a $4.2 billion silicone breast implant settlement. **Page 4**

■ Scientists predict stratospheric ozone depletion will get worse before ozone begins a slow recovery around 1998. **Page 5**

■ Princeton University chemists develop a new process that uses a titanium compound to reduce polychlorinated biphenyls, producing biodegradable compounds. **Page 5**

■ Two research groups announce independent syntheses of balanol, a natural product that is a potent inhibitor of protein kinase C enzymes, which are linked to a variety of diseases. **Page 6**

■ EPA proposes stricter air pollution standards for municipal waste incinerators to reduce emissions of metals, acid rain precursors, and dioxins. **Page 7**

■ Johnson & Johnson and Eastman Kodak reach an agreement for J&J to acquire Kodak's clinical diagnostics business for $1.01 billion. **Page 7**

COVER: Painting of Antoine-Laurent Lavoisier and his wife, by Jacques Louis David. The Metropolitan Museum of Art, Purchase, Mr. and Mrs. Charles Wrightman Gift, in honor of Everett Fahy, 1977. Copyright 1989 by the Metropolitan Museum of Art

Volume 72, Number 37
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BUSINESS

Silicone chemicals producer OSi Specialties—after more than a year on its own—plans to build on niche markets and technology to pay down debts, according to chairman David Barton. **Page 11**

Prospects are bright for Western Europe's petrochemical industry, but restructuring is needed to address overcapacity issues. **Page 13**

GOVERNMENT

From the ACS meeting in Washington, D.C.: Moving away from the Delaney clause seems inevitable, but Congress may not be so eager to do so because of public pressure. **Page 16**

Calls made to tighten safeguards, lower thresholds for detecting diversion of fissile material to stop nuclear thefts. **Page 17**

SCIENCE/TECHNOLOGY

Experimental chemistry and research needs are influencing software development, as indicated by new products introduced at exposition held during the recent ACS meeting. **Page 21**

New semiconducting materials are being heralded as novel electro-optic devices for use in energy saving systems. **Page 28**

From the ACS meeting: Polycyanurate resins continue to find useful applications, although the mechanism leading to polymerization still puzzles researchers. ■ Novel Raman microprobe spectroscopy technique is used as a diagnostic tool to probe silicone in tissue from breast explants. **Page 30**

EDUCATION

Chemical educators in developing countries are reaching more students through partnerships and "distance learning." **Page 35**

ACS NEWS

ACS Council adopts petitions on election matters and membership requirements during its meeting in Washington. ■ ACS News Service celebrates its 75th anniversary. **Page 49**

SPECIAL REPORT

Careful study of Antoine Lavoisier's day-to-day practice of chemistry reveals a scientist who—like his modern counterparts—had to feel his way into the unknown, learned what he was doing as he did it, and knew in advance just enough to take the next step in his work. Page 38

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LETTERS

CHEMICAL SAFETY

Hazard in hydrosilylation of D_4^{Vi} with D_4^H

We have read with interest the safety notification by DuPont and GE researchers [Potential hazard in hydrosilylation of D_4^{Vi} with D_4^H (C&EN, April 25, page 4)], and wish to comment that uncontrolled exotherms or explosions have been observed with vinylic silanes or siloxanes as the sole reactant. For example, thermal exposure of commercially available vinyl silanes in closed containers to about 200 °C has been noted to cause extremely rapid pressure increases to greater than 500 psig.

Thus, any chemistry involving significant concentrations of vinyl silicon compounds, that also involves elevated temperatures, as may occur during exothermic reactions, should be performed using the precautions recommended.

Curtis L. Schilling
Frank D. Mendicino
OSi Specialties
Sistersville, W.Va.

Plea for tolerance, balance

Immediately below the heading "Ethics, responsibility in science" (C&EN, July 25, page 4) there is a letter that criticizes C&EN for its handling of the fraud relating to the alleged control of enantioselectivity by a magnetic field.

I found C&EN commendable both in its editorial and news article (June 27, pages 3 and 7) and feel impelled to respond to the letter, which contains the sentences: "A large share of responsibility rests on the professor in charge who should have supervised and demanded ironclad evidence. We have already learned from the polywater, cold fusion, and immunological dilution episodes that editors of some scientific journals are more interested in publicity than reliability."

I agree completely with the first sentence of the quotation, but not the second. As a longtime reader of *Angewandte Chemie*, in which the article on the effect of the magnetic field was published, I believe that *Angewandte Chemie* is a journal of quality, reliability, and integrity.

Many ACS members serve as referees for one or another of the society's journals. Had we been assigned by an editor to referee that article, without the advantages of hindsight but on the basis of presented evidence, would we have denied its publication? I think not.

Furthermore, such fraud would not have occurred in an industrial chemical laboratory. The purported discovery would have initiated a series of meetings with patent attorneys and with management, accompanied by invention reports and demands for and execution of reduction to practice. Publication would had been delayed, and the initiator of the fraud discovered and fired. Industrial laboratories are not perfect, but the type of fraud being discussed here occurs, albeit infrequently, in academic laboratories and the reasons for it are outside the scope of this letter.

Those of us who perform as referees know that it is quite easy to referee articles where the scientific advance is in an established field. All too frequently, such

Corrections

- Aug. 22, page 47: R&D spending by Lubrizol in 1993 was $89 million, not $172 million. The company's R&D spending as a percent of sales for 1993 was 5.8%, not 11.3%. Total R&D spending in 1993 for the 16 chemical firms included in the table was $4,133 million, a change of –5% from 1992. Total 1993 R&D spending as a percentage of sales for these firms was 4.3%.
- Aug. 22, page 65: The number of master's degrees awarded in chemistry in the 1991 academic year was 1,665, not 1,165.
- Aug. 22, page 66: Foreign graduate students accounted for 32% not 25% of the total full-time graduate students in the sciences and engineering in 1992.
- Aug. 22, page 77: Barry M. Trost's affiliation was misstated. He is at Stanford University.

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the last half-penny a pound out of production," as larger commodity producers do. And he does not think OSi should be in both commodity and specialty chemicals, "because that gets confusing."

With clear insight into the specialty nature of OSi's business, Barton is confident that OSi will outgrow its debts and prosper as an independent specialty chemicals company. It will do so because OSi "provides technical service in support of product development that creates value on the customer's end," and, he could add, profits to pay down OSi's debt. □

European petrochemicals up; problems remain

The Western European petrochemical industry's prospects for 1994 are brighter—"after three difficult years," states Jukka Viinanen, president of the Brussels-based Association of Petrochemicals Producers of Europe, in APPE's just-published annual review of 1993–94.

The industry is seeing "encouraging signs of recovery," says Viinanen, who is also on the board of directors of Finnish oil producer Neste Corp. He cites a fistful of reasons: some improvement in demand; a more favorable trade balance for petrochemicals in Western Europe; olefin production at record levels, increasing plant capacity utilization rates; and a reduction in raw material costs that, coupled with some increases in petrochemical prices, showed up as improved profitability in the industry's first-quarter operating results.

According to APPE's first-half 1994 statistics, for example, production of ethylene was up 10% over first-half 1993, to 8.48 million metric tons, spurred by strong growth—13%—in the second quarter. For propylene, production in the half was up 11% to 5.02 million metric tons, as growth in output of 11% propelled each of the first and second quarters. For butadiene, strong second-quarter performance spurred growth of 8% in output in the first half, to 926,000 metric tons.

But even more than increased production driven by improving market conditions, Viinanen cites some structural improvements in the industry. For example, two new olefin crackers have gone on stream, the last in a wave of investments in new crackers that began in Western Europe in the late 1980s. The startups were followed by announcements of the closure of two less economical crackers. That, he says, has helped provide "real evidence that the competitiveness of the Western European petrochemicals industry has improved."

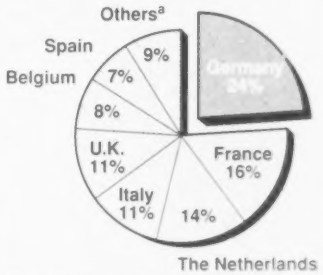
There is still much to be done, however. "The industry as a whole has far to go before an acceptable and sustainable level of return on capital employed is achieved and a climate for new investment is established," says Viinanen. "Above all, much remains to be done in resolving the well-recognized structural problems that are inherent in the Western European petrochemical industry. I fervently hope that a return to better times will not decrease the determination of the industry to find ways of resolving the difficult structural problems that it faces."

That hope is shared by others in the industry. According to John K. Robinson, chief executive of Cleveland-based BP Chemicals' performance and industrial products division, "Our fear is that this temporary good time will prevent companies from taking positive action to contribute to restructuring the industry."

Robinson was speaking specifically about the market for ethylene derivatives glycol and oxide, although he could have been speaking about other sectors in the industry as well.

He acknowledges "a real shortage" globally in ethylene glycol and ethylene oxide, because of several factors: planned and unplanned shutdowns, a

Germany tops European cracking capacity



Total European cracking capacity = 19.1 million metric tons

a Includes Austria, Finland, Greece, Norway, Portugal, Sweden, and Switzerland. Source: Association of Petrochemical Producers of Europe

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high demand for polyethylene terephthalate and polyester, and a seasonal inventory stocking for antifreeze. The result is that prices are up dramatically. Prices for ethylene glycol are expected to be 20 to 30% higher by the fourth quarter of this year, and those for ethylene oxide, 30 to 40% higher.

The ability to push through price increases is easing producers' problems, says Robinson, who notes that BP Chemicals showed a $100 million loss in 1993 on the glycol and oxide businesses.

The current shortages, however, won't solve underlying structural weakness, he adds. The shortage in ethylene oxide, for example, is expected to last "for more than six months but less than 12," by which time supply will have rebounded. By that time, Robinson gloomily predicts, producers will be back to operating with low 80% capacity use.

The only long-term answer is to take out excess, inefficient capacity, he says. "There is currently 1.7 million metric tons per year of capacity for ethylene derivatives in Western Europe—300,000 could come off the market as uncompetitive." He argues that BP Chemicals has done its bit by backing out of ethylene glycol production at Lavéra, France, to focus on improving efficiency in oxide production at Antwerp, Belgium.

Ethylene derivatives are not the only petrochemicals with troubled futures. Another case in point is polyethylene. The industry already has abundant supply, with that situation expected to last until close to the end of the decade. However, Union Carbide and EniChem are joining forces to build new polyethylene plants in Europe (C&EN, Aug. 8, page 8). And the announcement of the Carbide-EniChem venture has been quickly followed by the decision of the board of directors of Denmark-based Borealis to complete construction of a new polyethylene plant at Porvoo, Finland.

The management at Finland's Neste and at Norway's Statoil, which have merged petrochemical operations into Borealis, originally planned to complete the plant this year. However, "the depressed market situation and overcapacity in the polyolefins industry prompted construction work to be postponed," Borealis officials point out now. Under the revised plan just approved, the plant is scheduled to begin operation in the fourth quarter of 1995, and it will have a capacity of 120,000 metric tons per year.

Patricia Layman

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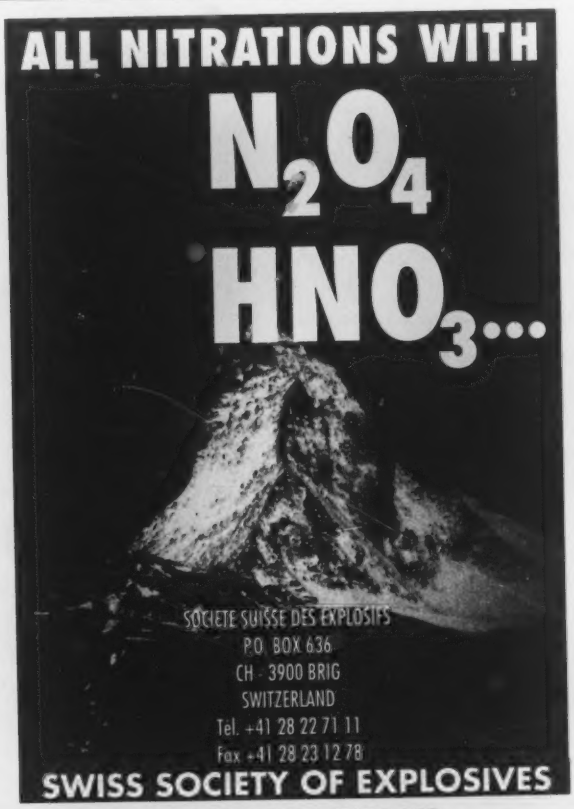

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